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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte TIMOTHY A. HINDLE, JAMES H. BOYD,
DAVID A. OSTERBERG, and TRISTRAM T. HYDE

Appeal 2008-0399
Application 10/816,007
Technology Center 3600

Decided: May 15, 2008

Before WILLIAM F. PATE, III, TERRY J. OWENS, and BIBHU R. MOHANTY, *Administrative Patent Judges*.

OWENS, *Administrative Patent Judge*.

DECISION ON APPEAL

The Appellants appeal from a rejection of claims 1-25, which are all of the pending claims.

THE INVENTION

The Appellants claim a vibration damping and isolation apparatus. Claims 1 and 8 are illustrative:

1. A vibration and isolation apparatus comprising:

a fluid having a true fluid mass, a density and a viscosity,

a first fluid containment chamber containing a first portion of the fluid;

a second containment chamber containing a second portion of the fluid;

an annular damping path connecting the first fluid containment chamber and the second fluid containment chamber and providing a fluid path between the first fluid containment chamber and the second fluid containment chamber; and

wherein the ratio of the cross-sectional area of the first fluid containment chamber and the second fluid containment chamber to the cross-sectional area of the annular damping path is chosen to produce an effective mass of the fluid to enhance vibration damping and isolation, the effective mass of the fluid greater than the true fluid mass.

8. A fluid filled isolator for vibration damping and isolation, the mechanical equivalent of the isolator comprising four tunable parameters and wherein the four tunable parameters comprising a first spring force in parallel with a second spring force, an effective fluid mass, the effective fluid mass based on a ratio of a cross-sectional area of a first fluid containment chamber and a second fluid containment chamber to a cross-sectional area of an annular damping path, and a first damper in series.

THE REFERENCES

Jones	US 4,811,919	Mar. 14, 1989
Kawamata	US 4,872,649	Oct. 10, 1989
Davis	US 5,332,070	Jul. 26, 1994

THE REJECTION

Claims 1-25 stand rejected under 35 U.S.C. § 103 over Davis in view of Kawamata or Jones.[1]

[1] The Examiner also relies upon US 4,763,884 to Matsui et al., US 4,779,853 to Sugino et al., and US 6,082,508 to Davis (Ans. 6). Because those references are not included in the statement of the rejection they are not

OPINION

We reverse the Examiner's rejection and, under 37 C.F.R. § 41.50(b), enter new grounds of rejection of claims 1-25.

Rejection under 35 U.S.C. § 103

The Examiner argues (Ans. 4):

> It is notoriously well known in the art to tune fluid mounts and dampers to damp specific vibrational frequencies by varying the respective areas of fluid chambers, the cross sectional areas of fluid passages, the areas of pistons etc. and/or the use of different fluids with different densities, or other properties, to create, change, or make use of a fluid inertia effect. This is generally taught by Kawamata in column 4 or Jones in column 7 lines 37-50. Note the discussion of the "fluid slug" throughout the specification of Jones.
>
> The ordinary skilled worker in the art would have found it obvious at the time of the invention to have adjusted at least one of these well known variable parameters in the device of Davis, as taught by either Kawamata or Jones, to provide a damper which makes use of the fluid inertia effect (inherent in Davis) to isolate a specific range of vibrations.

The Examiner does not specifically point out how Davis's device is to be modified to arrive at the Appellants' claimed invention. Hence, the Examiner has not established a prima facie case of obviousness of the Appellants' claimed invention.

New grounds of rejection

Under 37 C.F.R. § 41.50(b) we enter the following new grounds of rejection.

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properly before us and, consequently, have not been considered in reaching our decision. *See In re Hoch*, 428 F.2d 1341, 1342 n.3 (CCPA 1970).

Rejection under 35 U.S.C. § 102(b)

Claims 1-25 are rejected under 35 U.S.C. § 102(b) as anticipated by Davis.

Claim 1: Davis discloses a vibration damping and isolation apparatus (col. 3, l. 10), comprising a fluid, such as silicone, that necessarily has a true fluid mass, a density and a viscosity (col. 4, ll. 56-57), and first (46) and second (48) primary fluid chambers that contain, respectively, a first portion and a second portion of the fluid and are separated by a primary damping annulus (32) that provides a flow path between them (col. 6, ll. 60-64). Davis does not state that the fluid has an effective mass greater than its true mass. However, the effective mass, as defined by the Appellants, is the true mass multiplied by the square of the ratio of the cross-sectional area of the bellows to the cross-sectional area of the damping annulus (Spec. ¶ 0040). Hence, if the cross-sectional area of the bellows is greater than the cross-sectional area of the damping annulus, the effective mass is greater than the true mass. Davis discloses that "in the preferred embodiment the cross sectional area of the plurality of secondary fluid paths of one of the extensions 22, 24 is approximately 32 times as large as the cross sectional area of the damping annulus 32" (col. 7, ll. 5-9). That is done so "[t]he resistance to flow through the secondary fluid paths 26, 28 [which are approximately equal to the cross-sectional areas of the first (46) and second (48) primary fluid chambers; fig. 2] is made small as compared to the primary damping annulus 32 to minimize damping by such secondary fluid paths 26, 28" (col. 7, ll. 1-5). Because Davis's first (46) and second (48) primary fluid chamber cross-sectional areas are greater than the cross-sectional area of annular damping annulus 32, the effective fluid mass is

greater than the true fluid mass. Thus, in the same manner as the Appellants' apparatus, Davis's apparatus enhances vibration damping and isolation.

Claims 2 and 3: The cross-sectional area of Davis's annular damping annulus 32 necessarily can be changed to achieve the desired ratio of that cross-sectional area to the cross-sectional areas of extensions 22 and 24 and the related cross-sectional areas of the first (46) and second (48) primary fluid chambers (col. 6, l. 66 – col. 7, ll. 10). Consequently, Davis's apparatus is capable of permitting active tuning of the effective mass of the fluid.

Claims 4 and 5: Davis's apparatus necessarily is capable of supporting a payload having a fixed mass (col. 5, ll. 21-24), including payloads having a mass between the fluid's true mass and effective mass.

Claim 6: Davis's apparatus provides a roll-off of about -68 db (col. 4, l. 43), which reasonably appears to encompass -60 db.

Claim 7: The density and, correspondingly, the mass, of Davis's fluid necessarily can be changed.

Claim 8: Because, as discussed above regarding claim 1, Davis's apparatus is the same as that of the Appellants, it is a mechanical equivalent of the same things.

Claim 9: Davis's effective fluid mass is, by the Appellants' definition (Spec. ¶ 0040), the true mass multiplied by an amplification factor.

Claim 10: Davis's apparatus necessarily is capable of supporting a payload (col. 5, ll. 21-24), including a payload having a mass greater than the fluid's true mass and equal to or less than the effective mass.

Claim 11: Davis's first (46) and second (48) primary fluid chambers provide stiffness (col. 3, ll. 21-32).

Claim 12: Davis's annular damper 32 provides a shear force (col. 6, ll. 64-66).

Claim 13: Because, as discussed above regarding claim 1, Davis's apparatus is the same as that of the Appellants, it provides the same second spring force as the Appellants' apparatus.

Claim 14: Davis's effective mass is, by the Appellants' definition (Spec. ¶ 0040), proportional to the square of the ratio of the cross-sectional area of the first (46) and second (48) primary fluid chambers to the cross-sectional area of damping annulus 32.

Claim 15: Davis's apparatus provides a roll-off of about -68 db (col. 4, l. 43), which reasonably appears to encompass -60 db.

Claim 16: A comparison of Davis's figure 2 with the Appellants' figure 3 shows that Davis's apparatus includes the recited shaft, piston, first and second extensions, and primary and secondary isolation means. As set forth above regarding the rejection of claim 1, Davis's apparatus includes the Appellants' fourth parameter.

Claims 17 and 18: The cross-sectional area of Davis's annular damping annulus 32 necessarily can be changed to achieve the desired ratio of that cross-sectional area to the cross-sectional areas of extensions 22 and 24 and the related cross-sectional areas of the first (46) and second (48) primary fluid chambers (which correspond to the Appellants' primary isolation means) (col. 6, l. 66 – col. 7, ll. 10). Consequently, Davis's apparatus is capable of permitting active tuning of the effective mass of the fluid.

Claim 19: Davis's apparatus provides a roll-off of about -68 db (col. 4, l. 43), which reasonably appears to encompass -60 db.

Claim 20: Davis's fluid mass necessarily is capable of being changed, thereby changing the fluid mass effect.

Claims 21-24: Davis's apparatus includes a platform (flange 34) for supporting a payload. Because, as discussed above regarding claim 1, Davis's apparatus is the same as that of the Appellants, it is a mechanical equivalent of the same things and provides the same spring forces and shear forces.

Claim 25: Davis's effective mass is, by the Appellants' definition (Spec. ¶ 0040), proportional to the square of the ratio of the cross-sectional area of the first (46) and second (48) primary fluid chambers to the cross-sectional area of damping annulus 32.

Rejection under 35 U.S.C. § 112, second paragraph

Claims 6, 8-15, 19 and 21-25 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter the Appellants regard as the invention.

Claims 6, 15 and 19 are indefinite because the Appellants' Specification fails to provide a measure for determining the scope of the term of degree "significant."

Claims 8-15 and 21-25 are indefinite because they encompass all things that are a mechanical equivalent of the recited four tunable parameters, and the metes and bounds of those all things cannot reasonably be determined by reading the claims in light of the Appellants' Specification.

DECISION

The rejection of claims 1-25 under 35 U.S.C. § 103 over Davis in view of Kawamata or Jones is reversed. Under 37 C.F.R. § 41.50(b), new grounds of rejection of claims 1-25 have been entered.

This decision contains a new ground of rejection pursuant to 37 C.F.R. § 41.50(b). 37 C.F.R. § 41.50(b) also provides that Appellants, WITHIN TWO MONTHS FROM THE DATE OF THE DECISION, must exercise one of the following two options with respect to the new ground of rejection to avoid termination of the appeal as to the rejected claims:

> *(1) Reopen prosecution.* Submit an appropriate amendment of the claims so rejected or new evidence relating to the claims so rejected, or both, and have the matter reconsidered by the examiner, in which event the proceeding will be remanded to the examiner. . . .
>
> (2) *Request rehearing.* Request that the proceeding be reheard under § 41.52 by the Board upon the same record. . . .

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a). *See* 37 C.F.R. § 1.136(a)(1)(iv) (2007).

REVERSED, 37 C.F.R. § 41.50(b)

hh

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